Educating surgical patients to reduce the risk of venous thromboembolism: an audit of an effective strategy

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DECLARATIONS

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Summary

Objectives Venous thromboembolism (VTE) causes approximately 25,000 deaths each year from hospital-acquired thrombosis in the UK. Patient understanding of risk factors and preventive measures is important in preventing VTE. This audit was designed to assess surgical patient awareness and understanding of VTE risk factors and prophylaxis.

Design A questionnaire was designed to assess preoperative patient understanding of components of the National Institute for Health and Clinical Excellence (NICE) guidelines. Leaflets were designed to address gaps in understanding and junior doctors were given guidance on patient education. A second group of patients completed the same questionnaire after introduction of the education system.

Setting Worthing Hospital, UK.

Participants One hundred and twenty-one patients due to undergo major general surgery. Seventy-one participants completed the questionnaire prior to implementation of the education system, and 50 after.

Main outcome measures Improvement in patient awareness of VTE, its risk factors and its preventative measures (in response to the education system).

Results Following the introduction of a targeted VTE education system, there was a significant improvement in the awareness of VTE to 90% ($P < 0.01$), its signs to 80% ($P < 0.01$), and its preventative measures to 84% ($P < 0.01$).

Conclusions Patient education is of paramount importance in reducing the risks of VTE perioperatively. A simple method of introducing patient education at pre-assessment clinic and as part of their discharge planning, for major elective surgery, is an effective system in improving

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patient understanding of VTE, its risk factors and the importance of prophylaxis. It may also increase compliance.

Introduction

Venous thromboembolism (VTE) constitutes a spectrum of thromboembolic disease including both deep vein thrombosis (DVT) and pulmonary embolism (PE). It remains a considerable health burden causing approximately 25,000 deaths each year from hospital acquired thrombosis in the United Kingdom.[1] These are deaths which can and should be prevented through the use of established prophylactic measures. As such it has become a focus for improving standards of care in NHS hospitals. The National Institute for Health and Clinical Excellence (NICE) guidelines provide recommendations on assessing the risk of VTE and prophylaxis to be taken in the perioperative period.[2] The guidance highlights specific patient-related and admission-related considerations. Surgical patients are addressed specifically; they are considered at increased risk of VTE if undergoing a surgical procedure with total anaesthetic and surgical time of 90 min, or 60 min if the surgery involves the pelvis or lower limb.[2] Use of hormone replacement therapy or the oral contraceptive pill around the time of surgery is also considered a risk factor for VTE. Before starting mechanical or pharmacological VTE prophylaxis patients should be offered both verbal and written information regarding the risks of VTE, its consequences, prophylaxis and risk reduction.[2]

A large study from the USA showed that awareness of DVT, its symptoms and risk factors, was lacking among the general population (50%, 46% and 43%, respectively).[3] Of particular concern, only 15% were aware that DVT could be prevented, and only 5% had ever discussed the condition with a doctor.[3] Interestingly, among cancer patients awareness of the increased risk of VTE has also been shown to be low (53%).[4] Patient refusal is a common reason for late or omitted doses of prophylactic low molecular weight heparin and unfractionated heparin (39% and 44% of orders omitted, respectively, in one study).[5] A good level of patient understanding of risk factors and preventive measures is therefore important in preventing VTE. Addressing patients' individual needs and preferences is a key requirement in achieving satisfactory levels of concordance.[2] This allows patients to make informed decisions in partnership with their healthcare providers. Good communication and the importance of written information are thus highlighted in the NICE guidelines.[2] Standardized hard-copy and digital assessments have been shown to be effective for increasing VTE prophylaxis coverage in surgical patients,[6] however these do not address the impact of patient education and understanding.

This audit was designed to assess the level of information provided by junior doctors to patients about to undergo major general surgery (defined as surgery requiring admission postoperatively). Information provision and patient understanding were reassessed after education of junior doctors and the production of information leaflets to address gaps in understanding.

Materials and methods

Worthing and Southlands NHS Trust provides services to a local population of approximately 300,000. Seventy-one consecutive patients aged over 18 years undergoing elective major general surgery (upper or lower gastrointestinal procedures) were included between December 2007 and February 2008, constituting Group 1. A general surgical procedure was defined as major if it required a general anaesthetic of at least 90 min, or an inpatient stay of at least one night (i.e. not day surgery).

Patients were provided with a printed questionnaire on admission to address the key recommendations of the NICE guidelines. The questionnaire was in the form of seven yes/no questions (Table 1). Questionnaires were completed anonymously and in private.

Junior doctors who conducted pre-assessment clinic (foundation year one and two trainees) were subsequently provided with formal guidance on what information to provide at pre-assessment clinic. Information leaflets were also designed to address the lack of patient understanding and awareness of VTE identified by the

Table 1
Questionnaire given to Group 1 (before patient education) and subsequently Group 2 (after patient education)

1. Did you receive written information regarding the risk of blood clots in the calves or lungs, collectively known as venous thromboembolism (VTE), at pre-admission clinic?
2. Did you receive verbal information regarding the risk of venous thromboembolism (VTE) at pre-admission clinic?
3. Is there an increased risk of venous thromboembolism (VTE) around the time of surgery?
4. Does the use of the oral contraceptive pill within 4 weeks of surgery increase the risk of venous thromboembolism (VTE)?
5. Are you aware of the established prevention measures that can reduce the risk of venous thromboembolism (VTE)?
6. Are you aware of the signs and symptoms of venous thromboembolism (VTE)?
7. Did you find the information given to you at pre-assessment useful?
8. Has the information from pre-assessment clinic made you more likely to follow the prevention measures prescribed?

initial phase of the audit. These leaflets were provided at the pre-assessment clinic.

Fifty consecutive patients admitted for elective major general surgery (also for upper or lower gastrointestinal procedures) after the introduction of the information leaflets (Group 2) at pre-assessment were given the same questionnaire addressing the NICE guidelines prior to being consented for surgery. These patients were also given a copy of the leaflet upon discharge.

Chi-squared test was used in analysis and a P value less than 0.05 was considered significant.

Results

A total of 71 questionnaires were completed by Group 1 and 50 by Group 2 (Table 2). There was a 100% response rate. The median age of all 121 patients was 48 years (range 23–74 years). Background age and sex distribution were similar for both groups.

Before the introduction of patient education and targeted information leaflets, preoperative awareness of VTE and signs of VTE was low (49% and 50%, respectively). Knowledge of the risks associated with taking the oral contraceptive pill (OCP) in the perioperative period was also low (40%). Importantly, awareness of effective prevention measures was particularly lacking (39%).

Following the introduction of a targeted VTE education system, there was a dramatic, significant improvement in the awareness of VTE (90% vs. 49%; $P < 0.01$), its signs (80% vs. 50%; $P < 0.01$), and preventative measures (84% vs. 39%; $P < 0.01$). Patients were subsequently more likely to follow the preventative measures prescribed, although this did not reach statistical significance in this cohort. Postoperative prophylactic measures included TED stockings for all patients until adequate mobility was achieved, and prophylactic dalteparin while inpatients if one risk factor was present (e.g. obesity), in addition to general advice regarding rehydration and travel. Patients generally found both verbal and written information useful, with increasing numbers answering positively after the introduction of education.

Discussion

This audit examined the level of information provided by healthcare professionals with regards to VTE as directed by the NICE guidelines. It also looked at the effectiveness of patient information leaflets and verbal information in addressing gaps in understanding. The fact that the questionnaire was short and simple to understand, with a junior doctor available to answer queries, ensured most questions were answered by patients in both groups.

It is crucial that patients are aware of the risk of VTE following major surgery. As consent usually takes place on the morning of surgery, it is not surprising that some patients can be unfamiliar with the phenomenon of VTE and prophylaxis. It can be stipulated that patients would rather be aware at pre-assessment, as opposed to the morning of surgery. It is interesting to note that less than half of those patients in Group 1 correctly identified that there was an increased risk of VTE in the perioperative period following major general surgery. In addition, only 50% of patients were aware of the signs and symptoms of VTE. We are unsure whether this figure can be extrapolated

Table 2
Questions answered positively in each group (Group 1 = 71 patients before education and Group 2 = 50 patients after education)

Question	*Group 1*	*Group 2*	*P value*
1	8/71 (11%)	46/50 (92%)	<0.01
2	12/71 (17%)	45/50 (90%)	<0.01
3	35/71 (49%)	45/50 (90%)	<0.01
4	28/70 (40%)	29/49 (59%)	0.03
5	28/71 (39%)	42/50 (84%)	<0.01
6	35/70 (50%)	40/50 (80%)	<0.01
7	53/69 (77%)	46/50 (92%)	0.03
8	42/70 (60%)	37/50 (74%)	0.11

nationally. If so, we suggest it warrants further evaluation, with a potential public health approach to educate patients.

The level of information provided at pre-assessment and hence patient understanding was particularly low with regards to specific patient-related risk factors, such as the increased risk of VTE related to perioperative use of the OCP. This may be due to the medical presumption that women on the OCP are already aware of that risk, and so it is not specifically highlighted during preoperative assessment, or during the procedure of taking consent. Written information that patients can take home and read, such as the four-week time frame in which the OCP increases the risk of DVT, can thus be addressed adequately by such leaflets.

Most patients (61%) were not told of the effectiveness of established prophylaxis measures and this could impact upon compliance rates,[5] making patient education in this area of particular importance. Healthcare professionals often focus on the technical aspects of reducing VTE among inpatients (e.g. using TED stockings perioperatively, foot pumps intraoperatively, and ensuring adequate hydration levels) but patient information regarding the risk factors, signs and symptoms for VTE is lacking. In the era of the patient-centred approach to treatment, patients should be educated in order to provide them with this valuable information. Assessing a patient's risk of VTE in the perioperative period goes hand-in-hand with patient education, as per NICE guidelines. Patients' self-reported compliance increased after the introduction of the VTE education system but not to a statistically significant level. This may be explained by the high pre-intervention score (60%), reducing the potential for improvement. Had this cohort been larger it may have reached statistical significance. It would have been beneficial to capture the perception of satisfaction of both patients and physicians with this simple and effective intervention; unfortunately we did not include any questions as such. We hope that future evaluations address patient and physician satisfaction.

Conclusions

Patient education is of paramount importance in reducing the risks of VTE perioperatively. Written information using non-medical language is invaluable in helping patients to understand the risks and potentially improve compliance. A simple method of introducing patient education at pre-assessment clinic for major elective surgery has proven to be an effective system in improving patient understanding of VTE, its risk factors and the importance of prophylaxis, and may increase compliance.

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